The Backdoor to Overconsumption: The Effect of Associating 'Light' Food with Health.

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Abstract

Marketers present compromise food products (e.g. light chips) as a way to reduce consumers' conflict between the short-term desire of wanting a snack and the long-term goal of a healthy body. Policy makers welcome compromise products as a way to fight the obesity epidemic. Compromise products are typically associated with health. Two experiments and a survey were conducted to explore the effects of health references on the consumed amount of compromise products. Health references appear to increase consumption of compromise products for consumers with relatively weak food restriction goals, such as dietary restrained young women and dietary unrestrained older women. This suggests that associating compromise products with health messages may enhance rather than solve the obesity problem.

Key words: health goals, food consumption, disinhibition, cognitive load, restrained eating

Introduction

Excess fat and the adverse health consequences of obesity (which include diabetes, heart disease, hypertension and certain forms of cancer) constitute a growing health crisis that is global in scope (Abelson & Kennedy, 2004). More than one billion adults are overweight and at least 300 million of the overweight people are clinically obese (World Health Organization, 2003). Obesity is prevalent in virtually all ages and socioeconomic groups. Because genetic, environmental, and behavioral factors all contribute to obesity, it is a complex health issue for policy makers and society in general to address (Centers for Disease Control and Prevention, 2004). An important cause of obesity is the consumption of fattening snacks. Over the past decades, consumption of fattening snacks has increased enormously due to several factors. These factors include an increasingly available assortment of unhealthy food (high in fat, sugar and calories) (Raynor & Epstein, 2001), increasing portion sizes, and advertisements showing fattening snacks in innumerable tempting ways. Together with the reduction in physical activity, this increased caloric intake leads to a serious energy imbalance and inevitably to weight gain (CDCP, 2004). On the other hand, consumers face an environment that imposes beauty-ideals. The energy imbalance, together with these increasing societal norms of slimness, increases the need for self-imposed reduction of food intake. Among many other possible remedies, health organizations want to stimulate the market penetration of healthy positioned light products to reduce overall fat intake. However, this measure will have the desired effects only if the introduction of light products does not

increase consumption in general and absolute fat intake in particular. Because light products may be perceived as healthier than traditional products, absolute consumption may increase. In this paper, we explore how absolute consumption may change when low-fat snack foods are presented with subtle contextual health references.

We wanted to gain insight in the consumption effects of associating compromise products with health. Compromise products are snack foods that claim lower fat-content but identical taste as their 'regular' counterparts, and are often called 'light' products. These compromise products are positioned by marketers as a compromise between the short-term consumer need to indulge in temptations or cravings, and their long-term objectives to remain healthy or physically attractive. Given the products' presentation as harmless for gaining weight and the health and appearance ideals that are held by society, these products therefore seem to offer the perfect 'solution' for dieters. Moreover, because of the focus on low-fat content, these products are immediately associated to health, often reinforced by the label 'light' or by pictures of slim models. The study of the effects of positioning compromise products as healthy is timely because the World Health Organization encourages public policies to promote the availability and accessibility of a variety of low-fat, high-fiber foods in order to remedy the obesity problem. The WHO states that a remedy for obesity is "Creating supportive population-based environments through public policies that promote the availability and accessibility of a variety of *low-fat*, high-fibre foods, and that provide opportunities for physical activity" (WHO, 2004, italics added). Compared to a certain quantity of a snack, the same quantity of the low-fat version obviously contains less fat. However, policy makers need a more general understanding of the behavioral effects of the health associations accompanying compromise products. Do they support dieting efforts by activating the dieting goal? Or, worrying for society, do they lead to larger amounts consumed or more frequent snacking, leading to overall status quo in fat intake or even to an increase?

From a theoretical point of view, the health associations of compromise products may influence the consumption of dietary restrained consumers in two distinct ways (Bargh & Chartrand, 1999). One is by activating the health goal and its associations in memory, which in turn will keep dieters' long-term goals active (Metcalfe & Mischel, 1999). According to this mechanism, health references of compromise products could help consumers retain their self-control. Dieters are vulnerable to self-control break down when they are under cognitive load, a situation that occurs frequently in daily life (Ward & Mann, 2000). The sudden relaxation of

dietary restriction under cognitive load is called the disinhibition effect. Disinhibition is due to the fact that the load diverts attention from inhibitory restrictions. Under cognitive load, attention is narrowed to the most salient available cues, which -ironically- is often the food itself because trying to avoid eating keeps the mental representation of a food temptation active (Wegner, 1994). According to this mechanism, health references might activate the dieting goal and help dieters refrain from eating more of a snack product when they are under cognitive load (i.e. suppression of disinhibition). If health references could help consumers in retaining their self-control by activating the dieting goal, this would imply that health references of compromise products may be effective in combating obesity by reducing the possibility of a self-control break down.

Alternatively, the health references of compromise products may influence the interpretation of compromise products, as long as they are a priori ambiguous with respect to health (Wheeler & Petty, 2001). So, the activated health construct may serve as an interpretation frame for the ambiguous compromise products. This may result in assimilation effects (Stapel & Koomen, 2001): The ambiguous object (in this case the low-fat chips) may appear more consistent with the activated concept (in this case health) than without the health references. Such “disambiguation” would make the compromise products appear less threatening and consumption would increase. While both disambiguation and suppression of disinhibition seem a priori plausible for restrained eaters, disambiguation appears more likely for unrestrained eaters, who do not have strong diet/health goals to begin with.

The present studies were carried out in order to explore the effects of subtle health references on the consumption of compromise products. In a first experimental study (Study 1A) we pitted disambiguation and suppression of disinhibition against each other. A second experimental study (Study 1B) was performed to generalize the findings of the first study. The results of both studies necessitated an additional survey (Study 2) in order to draw some general conclusions.

Study 1A

We examined the effect of additional health references on the consumed amount of low-fat chips by applying a priming technique, resulting in two conditions: a control condition without health references (neutral prime) and an experimental condition with health cues (health prime). The aim of priming is to activate a concept (here health) in long-term memory (usually below the awareness threshold) by exposing participants to words related to that

concept (Bargh & Chartrand, 1999). With this priming technique, we simulated the presence versus absence of health references in the environment.

To investigate whether health primes suppress disinhibition, we needed to replicate Ward & Mann's (2000) disinhibition effect for restrained eaters (i.e. increased consumption under cognitive load). Therefore, we manipulated cognitive load. In addition, because disinhibition mainly occurs for restrained people, we also measured the participants' level of restraint.

In the neutral prime condition, we expected to find a disinhibition effect (cf. Ward & Mann, 2000), implying that the restrained participants would consume more under load than without load. The prediction for the health prime effect depends on the mechanism. If the health cues *suppress disinhibition*, the disinhibition effect should reduce in the health prime condition for the restrained participants. This implies that consumption of the restrained participants should be higher in the high load condition without the health prime than in each of the three other conditions. Furthermore, the consumption level in each of the three other conditions should be comparable. In contrast, if health references cause *disambiguation*, restrained participants should overconsume in the health prime condition without load. Under high load, the assimilation effect (i.e. the link between the health prime and the light chips) would be interrupted and would not occur. In other words, in the health prime condition with load, the regular disinhibition effect would occur. This implies that restrained participants' consumption should be lower in the neutral prime condition without cognitive load than in each of the three other conditions. Furthermore, the consumption level in each of the three other conditions should be comparable. So, we expect different consumption patterns to appear for disambiguation versus suppression of disinhibition for the restrained participants. For the unrestrained participants, we expected only the disambiguation effect to be present because they have no dieting goal that could be strengthened.

In summary, we measured the amount of low-fat chips consumed in a 2 (restrained vs. non restrained eaters) by 2 (high vs. low cognitive load) by 2 (health primes vs. neutral primes) between subjects quasi-experimental design.

Method

Participants

Ninety-four female undergraduate students participated in partial fulfilment of a course requirement. All were native Dutch speakers. Their ages ranged between 17 and 24 (mean age = 20.31, *SD* = 1.7). Participants had a mean height of 1.70 meters (*SD* = 2.4) and a mean

weight of 59.5 kg (*SD* = 8.0), for a mean BMI of 20.62 (*SD* = 2.4). The BMI is calculated as weight (in kilograms) divided by the square of height (in meters). Overweight is defined as having a BMI of 25-29.9 kg/m², while obese is defined as a BMI of 30 or more kg/m² (WHO, 1998). None of the participants was obese, five participants were overweight.

Procedure

The participants entered the lab in groups of five to ten and were seated in individual cubicles. They were randomly assigned to one of four experimental conditions.

Health vs. neutral prime manipulation. The participants first received a "language test" that primed them with health words or with neutral words. The language test was a scrambled sentences task (Bargh & Chartrand, 2000). Each sentence consisted of five words and participants were instructed to construct a grammatically correct four-word sentence. In the health prime condition, 15 of the 30 sentences in the test contained a word that was related to health. These 15 words were obtained from a pretest of 100 candidate words[1]. The words were chosen in a way that ensured that the health-related words would be used in the sentence composition. In the neutral prime condition the health-related words were replaced by neutral words.

Taste test. Subsequently, participants received two bowls, each containing 50 grams of the same brand of light chips, and an evaluation form[2]. They were told that they were participating in a taste test between *two different brands* of light chips. They had to rate each brand (that was not revealed) on several dimensions. They were allowed to eat as many of the chips as needed to fill out the taste test evaluation form.

Cognitive load manipulation. In the high cognitive load condition, each word of the questionnaire items of the taste test was written from right to left (e.g. 'spihc' for chips). On the form an instruction indicated how participants should read the items ("Attention, for experimental reasons, the following words are reversed, please read from right to left.")[3]. In the low cognitive load condition, the items were written as usual. We reasoned that reading from right to left would increase cognitive load by drawing additional cognitive resources to reading the questions.

Measures

Consumption. After the taste test, the remaining light chips were weighted, unbeknownst to the participants. Consumption was summed over the two bowls.

Reported eating behavior. At the end of the experiment, participants received the "Dutch questionnaire of Eating Behavior", developed and validated by van Strien, Frijters, Bergers, & Defares (1986). This questionnaire contains 33 items, which measure to what extent people are restrained (10 items), externally controlled (10 items) and emotionally controlled (13 items) in their eating behavior. Restraint was measured by e.g. 'Do you deliberately eat things that help you maintain your diet?'. An example of how the external control was measured is 'When you see or smell something tasty, do you develop an appetite for it?'. The emotional control of eating was measured e.g. 'When something bad is going to happen to you, do you feel like eating?'. The test allows to classify respondents as dietary restrained or unrestrained. Participants were classified as restrained when their score on the restraint scale was higher than the normal average score for women (2.64, in this Study, n = 49, 52% restrained), as established by van Strien et al. (1986).

Hunger level. At the end of the questionnaire, the participants had to indicate how much time had elapsed since their last meal before entering the lab, as a proxy of their hunger level.

Results and Discussion

Effects of manipulations on the consumed amount

We conducted an ANOVA on the amount of consumption with Prime (health vs. neutral), Cognitive load (present vs. absent), and Restraint (dichotomized) as independent variables. The three-way interaction between Prime, Cognitive load and Restraint was significant, $F(1, 86) = 4.55$, $p < 0.04$, $\eta^2 = 0.05$. In the neutral prime condition, we obtained a two-way interaction effect between Restraint and Cognitive load ($F(1,86) = 8.29$, $p < 0.006$). Restrained eaters consumed more under cognitive load ($M = 18.76$, $SE = 2.52$) than without load ($M = 7.03$, $SE = 2.84$) ($F(1,86) = 9.54$, $p < 0.003$; see Figure 1), replicating Ward and Mann's (2000) disinhibition effect. Load did not affect unrestrained eaters' consumption significantly. In the health prime condition, the interaction between Restraint and Cognitive load was not significant ($F<1$). In fact, none of the four cell means differed significantly (all F's < 1.4, all p's > 0.25).

INSERT FIGURE 1 ABOUT HERE

Consistent with both mechanisms, cognitive load did not affect consumption in restrained eaters primed with health ($F<1$). To evaluate whether the health prime suppresses

disinhibition or disambiguates the compromise product, we tested some additional contrasts for the restrained participants. The health prime marginally increased food consumption in restrained eaters without load (health condition: M = 14.3, SE = 2.84 versus neutral condition: M = 7.03, SE = 2.84), $F(1,86) = 3.27$, $p<0.08$. Restrained participants primed with health (irrespective of load) consumed more (M = 15.73, SE = 2.6) than restrained participants neutrally primed (in the no-load condition (M = 7.03, SE = 2.84) $F(1, 86) = 6.26$, $p<0.02$). This pattern is more consistent with a disambiguation process than with a disinhibition suppression process. So rather than reinforcing the dieting goal in subtle ways and buffering the disinhibition effect, the prime seemed to serve as a disambiguator for the restrained participants. The chips were perceived not as threatening but as contributing to the dieting goal, justifying increased consumption when not mentally loaded. In addition, the cognitive load in the health prime condition (M = 16.95, SE = 2.6) also increased consumption compared to the neutral prime condition without load (M = 7.03, SE = 2.84) $F(1, 86) = 6.61$, $p<0.02$, implying that the load again disinhibited the restrained participants, which is inconsistent with the disinhibition suppression mechanism. Rather, they ate as much in the no load as in the load condition when primed with health.

For unrestrained eaters without cognitive load, however, priming with health words did not change potato chips consumption ($F<1$). We had expected that also for them, the health primes would make the light chips appear as healthier leading to an increased consumption. We see two possible reasons for this null effect. First of all, unrestrained eaters may not have perceived the light chips as ambiguous with respect to health in the first place, leaving no room for interpretational shifts due to priming. Second, unrestrained eaters may simply not care whether the chips are healthy or not.

Our primary concern in this series of studies was to gain more insight in the effect of health references on consumption amount in cognitively loaded restrained eaters. Therefore we conducted a replication study, seeking generalization of this effect to a more representative population, and to another mental load task.

Study 1B

Method

Participants

In total, 73 female (aged between 26 and 60, mean age = 44, SD = 8.0) members of a local research agency consumer panel participated in the study in exchange for €15 worth of household products. Most of them were housewives. Participants had a mean height of 1.64

meters (*SD* = 0.06) and a mean weight of 67.5 kg (*SD* = 12.7), for a mean BMI of 25.2 (*SD* = 4.6). Fifteen participants (20.5%) were overweight and eleven (15%) participants were obese. All were native Dutch speakers.

Procedure

Participants came in groups of six to eight to the facilities of the research agency, and were randomly assigned to one of the four experimental conditions. Stimuli, procedure, and measures were identical to those in study 1A, except for a difference in the manipulation of cognitive load. Load was manipulated by presenting the taste test evaluation form to half of the participants in their native language (Dutch), and to half of the participants in French, a language they all understood but did not use very often. The French evaluation form was assumed to involve more cognitive load than the evaluation form in their native language. Again, participants with a restraint score higher than the norm for women (2.64), were classified as restrained (*n* = 38, 52% restrained).

Results

Effects of manipulations on the consumed amount

The consumed amount was not related to age or hunger level. We conducted an ANOVA on the amount of consumption with Prime (health vs. neutral), Cognitive load (present vs. absent), and Restraint (dichotomized) as independent variables. The three-way interaction between Prime, Cognitive load and Restraint was significant, $F(1, 65) = 5.16$, $p < 0.03$, $\eta^2 = 0.073$. However, the results were inconsistent with those of Study 1A (see Figure 2). We did not observe a significant disinhibition under cognitive load in restrained eaters. Actually, neither the load manipulation, nor the priming manipulation had any effect for restrained eaters (all *F*'s <1). For unrestrained eaters, a significant two-way interaction between prime and cognitive load emerged, $F(1, 65) = 10.32$, $p < 0.003$. A marginally significant 'disinhibition' effect does appear in neutrally primed unrestrained eaters (no load: $M = 8.64$, $SE = 3.97$ versus load: $M = 17.74$, $SE = 3.68$, $F(1, 65) = 2.83$, $p < 0.1$). More remarkable though was the finding that, in the no load condition, health primes substantially increased potato chips consumption in the group of unrestrained eaters, $F(1, 65) = 16.73$, $p < 0.0002$ (neutral no-load condition: $M = 8.64$, $SE = 3.97$ versus health no-load condition: $M = 32.72$, $SE = 4.35$). The health prime again seemed to serve as a disambiguator of the light chips, but this time only for the unrestrained participants. Under load, this effect is not present.

The load apparently prevents the disambiguation effect from occurring. Furthermore, the unrestrained participants have no dieting goal, implying that the load does not increase their consumption.

INSERT FIGURE 2 ABOUT HERE.

Discussion

Before we discuss the implications of our findings for theory and public policy, we will first try to explain the inconsistency between studies 1A and 1B. Studies 1A and 1B differ in several aspects, but the most salient and important difference seems to be participants' age. We will focus on this difference to find an explanation for the differences in results of both studies. Across the two studies, we find an increase in consumption as a result of cognitive load for two groups: for the neutrally primed young restrained (Study 1A) and the neutrally primed old unrestrained (Study 1B). However, consumption increases in both groups, without cognitive load, when they are exposed to health primes. So, the question becomes what the young restrained and the old unrestrained have in common, because they react similarly to the cognitive load and the health prime (see Figures 1 & 2).

Self-control matures with training and age (Lee, Moschis, & Mathur, 2001; Metcalfe & Mischel, 1999; Muraven, Baumeister, & Tice, 1999), so young restrained might lack the necessary skills to deal with ambiguous food temptations. Further, health concerns probably increase with age, so people might develop concerns about their food intake with increasing age, not only the restrained but also the unrestrained. There is indeed some evidence suggesting that age is associated with reduced preferences for sweet beverages and high-fat desserts and with an increase in preferences for whole grains, vegetables, and fruit (Drewnowski, Henderson, Hann, Barratt-Fornell, & Ruffin, 1999). Moreover, other studies showed that older adults not only have increased preferences for healthy food items but they also consume more of them (Caroll, 1983; Patterson & Block, 1988). One straightforward commonality between the young restrained and the old unrestrained might therefore be that they both harbor health/diet goals but that these goals are rather weak.

In line with this interpretation of existing but weak goals, the young unrestrained may not care at all about health and food intake. So for them, there is no goal at all to support or to break, hence the absence of any prime or cognitive load effect. In contrast, the old restraints

have a lifetime of experience with all kinds of ambiguous temptations. Their cognitive networks motivating self-control are probably difficult to shake (Metcalfe & Mischel, 1999).

In order to test the assumptions made in the explanation of the inconsistent results of studies 1A and 1B, an additional study was performed. In this study, we tested the assumption that older women are more concerned about their health than younger women and that the older women have a stronger developed dieting goal than the younger women.

Study 2

Participants

This study concerns a survey. Snowball sampling provided 110 female respondents. Of these participants, 52 women were aged between 28 and 62 (mean age = 48, *SD* = 10), comparable to the population of study 1B, and 58 women were aged between 19 and 24 (mean age = 20, *SD* = 1.03), comparable to the population of study 1A. Participants in the older age category had a mean height of 1.65 meters (*SD* = 0.06) and a mean weight of 69.2 (*SD* = 9), the younger females had a mean height of 1.68 meters (*SD* = 0.14) and a mean weight of 59.7 kg (*SD* = 6.9). Of the younger women, one girl was overweight and another girl was obese. Twenty older women were overweight and four older participants were obese.

Survey

Word completion task. For each of 20 words, participants were asked to fill in the word that spontaneously came to mind after seeing the first two characters (i.e. the stem) and the number of characters missing from the target word. This task was designed such that half of the words could be completed by health-related words (*n* = 8; e.g. ‘na….’ for ‘nature’ and ‘he…..’ for ‘healthy’) and half by diet-related words (*n* = 8; e.g. ‘di..’ for ‘diet’ and ‘th..’ for ‘thin’)[4]. Note that each stem could also be completed with non-health or non-diet words (e.g. ‘dive’ for ‘di..’ and ‘native’ for ‘na....’) and that the number of dots reflected the number of missing characters. These words were taken from two pretests that asked respondents to rate one hundred words on their relatedness to health and diet respectively. Four words were overlapping, meaning that they relate to both health and diet (e.g. ‘fruit’ and ‘sport’). For each participant, the number of stems completed with health and diet related words were counted.[5]

Ranking of goals. Subsequently, participants had to rank six goals, namely, ‘happiness’, ‘health’, ‘good looks’, ‘recognition’, ‘love’ and ‘wealth’. They were asked to put the goal they

considered most important on the first place (rank = 1) and the least important on the last place (rank = 6).

Eating behavior. Participants were also asked to fill in some questions about their eating habits, namely the 10 restraint items of the "Dutch Eating Behavior Questionnaire" (van Strien et al., 1986) and the "Dietary Restraint Scale" (Herman & Polivy, 1980). The test allows to classify respondents as dietary restrained or unrestrained. Participants with a restraint score (DEBQ) higher than the average score for women (2.64) (van Strien et al., 1986), were classified as restrained (n = 67; 60.9% restrained).

Results and discussion

A MANOVA, with age category (old vs. young) as independent variable and the number of health-related words (word completion task), the number of diet-related words (word completion task), the rank of 'health' and the Body Mass Index resulted in a significant Wilk's Lambda = 0.69 $F(5, 102) = 9.30$, $p < 0.0001$. To follow up on this effect, we explored these effects for each variable separately.

Word completion task.

An ANOVA with Age category (old vs. young) and Restraint as independent variables and the number of *health-related* words as dependent variable showed a significant effect of Age category, $F(1, 106) = 3.96$, $p < 0.05$, $\eta^2 = 0.036$. The older women ($M = 2.4$, $SE = 0.21$) completed the stems more often with health-related words than the younger women ($M = 1.8$, $SE = 0.18$). Moreover, for the health-related words, a marginal two-way interaction, $F(1, 106) = 3.26$, $p < 0.08$, $\eta^2 = 0.03$, was found between Restraint and Age category. This interaction showed that the older restrained women ($M = 2.7$, $SE = 0.23$) completed the stems more often with health-related words than the younger restrained women ($M = 1.6$, $SE = 0.25$), $F(1, 106) = 9.57$, $p < 0.003$. All other differences were not significant.

The effect of Age category on the number of *diet-related* words was also significant, $F(1, 106) = 6.75$, $p < 0.02$, $\eta^2 = 0.06$. The older women ($M = 2.4$, $SE = 0.21$) filled in more diet-related words than the younger women ($M = 1.7$, $SE = 0.18$).[6]

These results indicate that concerns about dieting and health increase with age. Older women spontaneously completed more diet- and health-related words than younger women, indicating a stronger health goal and a stronger dieting goal. The older restrained women have thus a strongly developed dieting and health goal. These goals are complementary to each other

and therefore, may strengthen each other, which makes it harder to draw attention away from these goals.

Ranking of goals and eating behavior (restraint).

The older women rank (1-6) 'health' as more important (average rank = 1.77) than younger women (average rank = 2.19), $p < 0.0001$, Mann-Whitney U test. In addition, the mean score on the restraint scale is higher for the older women, $F(1, 108) = 4.96$, $p < 0.03$, $\eta^2 = 0.044$. The young women have a mean restraint score of 2.52 ($SE = 0.11$), whereas the mean restraint score of the older women is 2.87 ($SE = 0.11$). Also, the older women are more likely to be classified as restrained than the younger women, $\chi^2(1, n = 110) = 2.89$, $p < 0.09$. These results support our assumption that older women are more concerned about their health, which may imply that they restrain their eating behavior in accordance.

Weight and Body Mass Index.

The mean weight of the older women (mean weight = 69.2, $SE = 1.13$) is higher than that of the younger women (mean weight = 59.7, $SE = 1.05$), $F(1, 106) = 38.43$, $p < 0.0001$, $\eta^2 = 0.27$. In accordance, the older women generally have a higher Body Mass Index than the younger women $F(1, 106) = 90.59$, $p < 0.0001$, $\eta^2 = 0.46$, possibly resulting in increased health concerns and stronger dieting goals. Additionally, the mean Body Mass Index of Study 1A (mean BMI = 20.62, $SD = 2.4$) is comparable with the BMI of the young women in this study (mean BMI = 20.61, $SD = 2.1$). The BMI of Study 1B (mean BMI = 25.2, $SD = 4.6$) is comparable with the BMI of the older women in this study (mean BMI = 25.6, $SD = 3.3$).

Overall, several indices of goal strength indicate that older women have stronger health concerns and hence, stronger behavioral goals related to health, such as food regulation. Although for each individual index there might be alternative explanations, taken as a whole, this evidence supports the assumption that we needed to make sense of the differences between Studies 1A and 1B. Namely, we found evidence that older women are more concerned about their health, and have a stronger developed dieting goal than younger women. These findings support the results of the Studies 1A and 1B, where we found a disinhibition effect for the young restrained and the old unrestrained women when they are neutrally primed. Moreover, consumption increased for these two groups when primed with health but not under cognitive

load. The explanation for these findings is thus that both groups have a weak health/dieting goal in common.

General discussion

The aim of our research was to explore whether subtle health references discourage or encourage overconsumption of compromise products. We distinguished two potential effects of subtle health references in a consumer's food decision environment. First, such references may activate people's long-term goals related to health, including restrained eating goals. These mechanisms would reinforce consumers' resistance to temptations. Second, health references may affect the interpretation of the ambiguous temptation. This mechanism would make consumers more vulnerable to ambiguous temptations, because the 'vicious' temptation would become perceived as a less threatening product. In our studies, we found no evidence for the first, self-control reinforcing process at all. Rather, we twice found that health references increased consumption of the ambiguous food. The health references increased consumption for restrained young women in the first study (Study 1A), and for unrestrained older women in the replication study (Study 1B). We did not find any effect of the health references for the unrestrained in the first study, nor for the restrained of the replication study. The last study (Study 2) showed that both groups that were affected by the health references, that is the young restrained and the old unrestrained, have weak diet/health goals.

The results suggest that women with weak diet/health goals, namely the younger restrained women and the older unrestrained women, increase consumption of low-fat chips, a compromise snack product, when this food product is accompanied by health references. The young restrained women may have a diet goal that is still weakly developed because they lack experience with food temptations. Distraction easily reduces the impact of the food regulation goal. Given the ironic pre-occupation with food, distraction results in overconsumption. We showed that health references do not strengthen the diet goal but rather disambiguate the implications of the light chips for one's dieting goals. The result is increased consumption. Subtle health references are clearly not effective in preventing the disinhibition effect from occurring in the younger women population.

Much in the same vein, we assume that older unrestrained women have a weakly developed food regulation goal that emerges from their growing health concerns. The goal is still weak. They still have to develop the habit of considering unhealthy and fattening food items as temptations. Distraction, for them too, reduces the impact of the food regulation goal. We showed that health references do not strengthen the diet goal but disambiguate the

perceived implications of the light chips for one's health. Probably because the health goal is more important to them than to the younger, the effect of references to health is also much stronger.

Further, for two groups, we did not find effects of either cognitive load or health references. We assumed that one group (the younger unrestrained women) does not harbor food regulation goals at all, and is therefore not vulnerable to environmental food cues. This interpretation aligns with the potential disastrous effects of attempts to control food regulation (the disinhibition effect, see introduction). We assumed that another group (the older restrained women) combines an increased health concern with a strongly developed dieting goal, which makes distraction from these goals very hard. The cognitive load task is probably not strong enough to draw attention away from these goals. In fact, Mischel and Metcalfe's (1999) model of self-regulation implies that self-control matures with age. Although self-control might have a large cost early in life (cf. the disinhibition effect), it may eventually pay-off later on. If this finding would generalize to other subtle cues and distractive circumstances, it would actually be reassuring, as it suggests that the overconsumption phenomenon is not insurmountable for older restrained women.

A limitation of our research is the restriction to compromise products, preventing straightforward generalization of the findings to traditional snack foods. We justify our focus on compromise snack products by the attention they receive in public policy concerning obesity. Moreover, it has been shown that consumers ration the purchase quantities of 'vice' products, i.e. products that satisfy a short-term desire but hurt the attainability of long-term goals (e.g. regular potato chips), in order to solve their self-control problem (Wertenbroch, 1998). Consumers believe that limiting the stock of vice products reduces the temptation to overconsume vices and are therefore prepared to forgo quantity price discounts. Furthermore, for (relative) 'virtue' products, i.e. products that provide more utility in the long-run than (relative) vice products (e.g. compromise products such as low-fat potato chips), consumers do not experience a self-control threat. Hence, they tend to stockpile these virtue products at home. However, stockpiling makes people consume products at a faster rate (Chandon & Wansink, 2002). These findings suggest that low-fat versions of unhealthy snacks may be more readily stockpiled at home and that health references (e.g. in advertisements or on packages) may encourage overconsumption of these compromise snacks. People might end up consuming as much fat or even more fat than when they consume traditional high fat food. For traditional snack food products, the health references might be less likely to lead to overconsumption

because consumers already apply strategies in order to resist these tempting food items (e.g. avoidance of stockpiling of these products at home) and because disambiguation in the direction of ‘healthy food’ is much less likely. All this might sound like good news to marketers in the short run, but sounds worrying for society in the long run, given the recent boom in the demand and supply of low-fat and other ‘light’ products (ADA, 1998). The data imply that the promotion of the so called compromise products, positioned as healthy, may be a bad strategy to halt the obesity epidemic.

The restriction to compromise products calls, on the other hand, for future research that explores boundary conditions, practical implications, and possible ways to reduce the overconsumption effect due to subtle health references. How (un)ambiguous can the product be for the assimilation effect to occur? Do the obtained effects generalize to traditional snack products? Would weaker health claims still lead to increased consumption in the context of subtle health cues? Would activating the restraint goal itself rather than a related concept provide a better buffer against ambiguous temptations? The final goal should be a detailed understanding of the various ways in which marketing promotes, obstructs, and generally interacts with consumer’s health and dietary self-control.

Figure 1

Consumption as a function of prime, cognitive load and restraint, study 1A

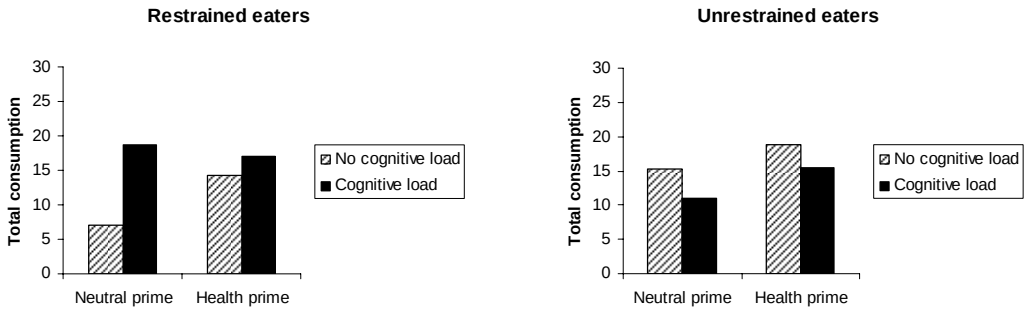
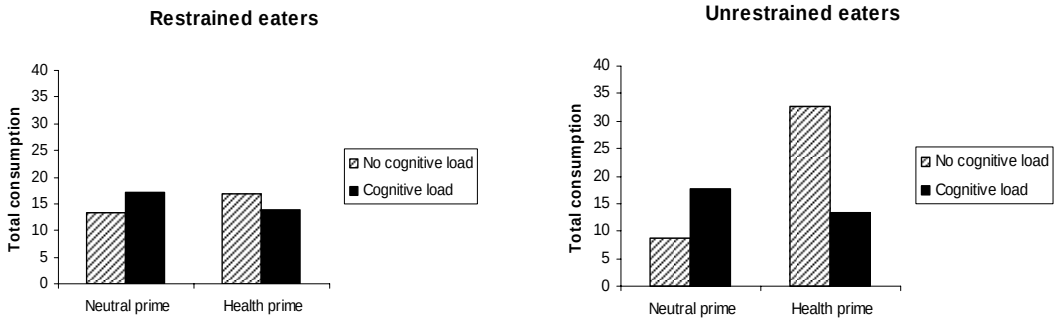


Figure 2

Consumption as a function of prime, cognitive load and restraint, study 1B



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Footnotes

[1] The fifteen words retained from this pretest are (translated from Dutch), ‘healthy’, ‘apple’, ‘biking’, ‘jogging’, ‘fit’, ‘fruit’, ‘vegetables’, ‘laughing’, ‘lively’, ‘forest air’, ‘nature’, ‘kiwi’, ‘sleeping’, ‘sports’, and ‘vitamins’.

[2] All participants received ten minutes to finish the taste test, which was sufficient for everyone.

[3] This clarification was deliberately held vague, but none of the participants asked questions about it.

[4] Actual stimuli were in Dutch.

[5] The overlapping words were counted twice.

[6] The effects of Restraint and the interaction between Restraint and Age category were not significant.